

**NATO STANDARD**

**AMedP-7.2**

**CBRN FIRST AID HANDBOOK**

**Edition A Version 1**

**FEBRUARY 2018**



**NORTH ATLANTIC TREATY ORGANIZATION**

**ALLIED MEDICAL PUBLICATION**

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**NATO LETTER OF PROMULGATION**

15 February 2018

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## CHAPTER 1: INTRODUCTION

### 1.1. AIM

The aim of this Allied Medical Publication (AMedP) is to provide a standardised approach to the early management of any casualty in a CBRN threat-environment<sup>1</sup> by non-medical personnel from point of exposure (or recognition) until handover to medical personnel at a casualty collection or exchange point.

### 1.2. CONTEXT

Non-medical personnel on operations at risk from trauma or CBRN exposure should be able to recognise and initially manage life-threatening conditions. The principles of CBRN casualty management, as described in AMedP-7.1: *Medical Management of CBRN Casualties*, underpin the provision of first aid especially in the first ten minutes. The level of first aid training will depend on an individual or unit's role (i.e. generalist, CBRN specialist, special operations forces (SOF), and medical personnel). CBRN first aid will include initial recognition, self-administered CBRN medical countermeasures (MedCM), immediate therapy MedCM, and conventional first aid skills applied in a CBRN-threat environment. Additional enhanced competencies may be required for personnel at greater risk of sustaining CBRN casualties (i.e. CBRN specialists), or where there are special operational constraints including prolonged field care (i.e. SOF).

### 1.3. SCOPE

1. This AMedP describes the provision of first aid in a CBRN-threat environment by non-medical personnel or medical personnel in a non-permissive environment (hot zone). The main focus for CBRN first aid is the management of a trauma or chemical casualty due to immediate or short-onset effects. However, enhanced first aid training should also include the recognition and reporting of biological and radiological casualties.

2. Heat illness is a known risk from the use individual protective equipment (IPE) and personnel should be able to recognise and manage heat-related injuries including heat stroke. Psychological casualties may also occur for a number of reasons and may also need to initially be managed at a unit level.

3. Unlike previous CBRN first aid publications, this guidance is applicable not only to CBRN Defensive Operations but also in response to terrorist / insurgency events as part of the wider Defence against Terrorism (DAT) programme in a civilian or military environment. However, specific incident management is outside the scope of this document but details on medical CBRN incident management can be found in AMedP-7.1 Part 2: *CBRN Medical Incident Management*.

4. This AMedP also provides an outline of the training requirement and first aid materiel for use in a CBRN environment including casualty protective equipment (CPE) for the initial response and unit level casualty evacuation (CASEVAC). This is detailed in [Annex A](#).

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<sup>1</sup> For the purposes of this document, a CBRN-threat environment is an operational environment where there is a potential, suspected or confirmed release or presence of a CBRN agent. This may require the responder and/or casualty to be wearing protective equipment.

## 1.4. RELATED DOCUMENTS

1. This publication is linked to a suite of CBRN medical publications (AJMedP-7 series) and conventional first aid publications. These include:

- a. AJMedP-7: *Allied Joint Medical Doctrine for Support to Chemical, Biological, Radiological and Nuclear (Cbrn) Defensive Operations.*
- b. AMedP-7.1: *Medical Management of CBRN Casualties.*
- c. AMedP-1.10: *Medical Aspects in the Management of a Major Incident / Mass Casualty Situation.*
- d. AMedP-1.12: *Medical and Dental Supply Procedures.*
- e. AMedP-8.6: *Forward Mental Healthcare.*
- f. STANAG 2122: *Requirement for Training in First Aid, Emergency Care in Combat Situations and Basic Hygiene for all Military Personnel.*
- g. STANAG 2126: *First Aid Dressings, First Aid Kits and Emergency Medical Care Kits.*

2. AMedP-7.2 also incorporates the previous editions of:

- a. STANAG 2358 (Edition 4): *First Aid and Hygiene Training in a CBRN or TIH Environment.*
- b. STANAG 2871 (Edition 4): *First Aid Materiel for Chemical Injuries.*

3. Changes and revisions of this publication will reflect best practice including:

- a. Lessons identified reports from national, NATO and international exercises and operations including Exercise Clean Care 2016.<sup>2</sup>
- b. Research publications from the NATO Science and Technology Organisation especially the Human Factors and Medicine (HFM) Panel.

## 1.5. DEFINITIONS

CBRN and medical terminology is consistent with AAP-21(B) and AMedP-13(A) respectively or those definitions that have been transferred into the NATO Terminology Database.

## 1.6. STRUCTURE OF AMedP-7.2

This publication consists of three chapters and supporting Annexes including guidance on training (Annex A), first aid materiel (Annex B), CPE supporting CBRN first aid (Annex C), CBRN First Aid Training Materiel (Annex D), and casualty reporting form (Annex E). This publication is supported by the Standardisation Related Document (SRD) AMedP-7.2.1: *CBRN*

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<sup>2</sup> The Exercise Clean Care series remains the key NATO exercise for the testing of concepts, doctrine, procedure and interoperability for CBRN casualty care. This is part of a wider Lessons Learnt cycle including capability development, training, observations and analysis.

*First Aid Tactical Aide-Memoire*. The QR code at the end of this chapter will provide link to the electronic version of the SRD.

## **1.7. RESPONSIBILITIES FOR INITIAL CBRN CASUALTY CARE**

### **1.7.1. PROVISION OF CBRN FIRST AID**

1. First aid is a unit level responsibility and this also applies in the CBRN-threat environment. This provision of casualty care includes the recognition of the effects of a CBRN agent, providing life-saving interventions (LSI) such as immediate therapy MedCM, CASEVAC and handover to medical personnel.

2. Once casualty is handed over to medical personnel, the patient becomes the responsibility of the medical support organisations (J4 MED) and includes medical evacuation (MEDEVAC). Medical personnel in this environment are likely to be limited to enhanced CBRN first aid also, until it is safe to deliver more technical levels of casualty care (e.g. CBRN emergency medical treatment (EMT) followed by advanced medical care).

3. [Annex B](#) provides a list of first aid material that may be used by medical and non-medical personnel.

### **1.7.2. PROVISION OF CASUALTY DECONTAMINATION**

The responsibility as well as provision for casualty decontamination may vary between nations and will require agreement during operational and mission planning. Following handover to medical personnel, the enhanced CBRN first aid provider may be required to support the casualty decontamination, especially in austere environments.

### **1.7.3. FATALITY MANAGEMENT**

Fatality management especially in a CBRN environment will be challenging and is outlined in Chapter 2 but remains an executive and logistic function.

### **1.7.4. PROVISION OF CBRN FIRST AID TRAINING**

Depending on national first aid training delivery, medical services may be responsible for the delivery of CBRN-related first aid either as special-to-role or pre-deployment training. This may be as part of training for CBRN defensive operations, or as a wider first aid, or remote / operational medicine training programme.

## **1.8. LEVELS OF CBRN FIRST AID TRAINING**

1. The levels of care delivered depend on the training of the individual. [Annex A](#) provides a competency framework for the delivery of CBRN-related first aid training while AMedP-7.3: *Training of Medical Personnel for CBRN Defence* provides training requirements for medical personnel. First aid training may be combined with other CBRN defensive training including the use of Individual Protective Equipment (IPE).

2. The levels of CBRN first aid training are:

- a. *All deployed personnel on CBRN Defensive Operations (CBRN generalist)*. Chemical first aid including self / buddy-administration of immediate therapy MedCM,

basic airway management, heat injury management, and handover to medical personnel. For CBRN Defensive Operations, all personnel must have this level of training and may be achieved by annual training or pre-deployment training.

b. *CBRN Specialist or Enhanced CBRN role.* Enhanced CBRN first aid providers may also be required to support walking and stretcher casualty decontamination (see paragraph 1.7). For enhanced CBRN first aid, it is recommended that 1 in 4 personnel can deliver this level of care but is proportionate to the CBRN threat and risk. This may be delivered as pre-deployment training or special-to-role.

c. *Deployed medical care.* The advanced level of care as described in AMedP-7.1 is outside the scope of this AP. AMedP-7.1 also provides the overarching principles and framework for CBRN first aid that may be provided in the most non-permissive CBRN environment (hot zone).

## 1.9. CONTRIBUTIONS, ACKNOWLEDGEMENTS & POINTS OF CONTACT

1. Contributions for this publication were through the COMEDS CBRN Medical Working Group, Biological Medical Expert Panel and Joint CBRN Defence Training and Exercise Panel, supported by the Exercise Clean Care contributors.

2. The custodian and point of contact for this Allied Publication is:

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QR Code Link to AMedP-7.2-1: *CBRN First Aid Tactical Aide-Memoire.*



## CHAPTER 2: PRINCIPLES OF CBRN FIRST AID

### 2.1. INTRODUCTION

1. Non-medical personnel at risk from trauma or exposure in a CBRN environment should be able to recognise and treat both CBRN and traumatic life-threatening conditions. The principles of CBRN casualty management apply to first aid and are particularly relevant to the initial management of casualties in the *first 10 minutes* or at a *forward casualty collection point* (CCP) before the arrival of medical personnel.

2. Due to the immediate effects or short latency period, the management of trauma and chemical exposures are the main focus for first aid training. However, training should also include the recognition of biological and radiological effects, and the reporting of significant symptoms and signs. First aid should be focused on the most severe (T1) casualties requiring life-saving interventions (LSI), but may also be provided to other casualties to prevent deterioration. Some personnel may also be managed with simple interventions and be returned to duty.

3. The management of trauma in a CBRN-threat environment remains a priority and uses the same <C>ABC approach. Chemical casualty management will also follow this general approach although some chemical agents will also have more agent-specific guidance as described in Chapter 3 and require antidote immediate therapy (see [Annex B](#)). These chemical agents include:

- a. Nerve agents.
  - b. Blistering (vesicants) agents.
  - c. Pulmonary (choking) agents.
  - d. Cyanides (blood) agents.
  - e. Incapacitating agents.
4. Additional first aid considerations include:
- a. The recognition and initial management of atropine overdose.
  - b. The recognition of heat illness and the initial management of heat stroke.
  - c. The recognition of a severe biological casualty (sepsis).
  - d. The recognition of acute radiation syndrome and local radiation injury including the reporting of any radiation exposures or dosimetry.
  - e. The recognition and initial management of psychological casualties.

### 2.2. THE PRINCIPLES OF CBRN CASUALTY CARE

1. The provision of CBRN casualty care may start from point of exposure (PoE) or wounding (PoW), and continues through to rehabilitation. Casualty care in a CBRN threat-environment is dependent on the person and their first aid or medical training, the hazards (CBRN or conventional) present and any individual protective equipment worn by either the

casualty or the responder. The presence of CBRN hazards define *functional zones of casualty care* (see next section).

2. The principles of CBRN casualty management across the continuum of care are:
  - a. Recognition (detection and diagnosis).
  - b. Safety (personal and collective protective measures).
  - c. Self-aid & first (buddy) aid.
  - d. Triage.
  - e. Casualty assessment 'Quick Look'.
  - f. Life-saving interventions.
  - g. Casualty hazard management (see Section 2-7).
  - h. Advanced medical care.
  - i. Rehabilitation (physical, mental and social).
  
3. The priorities for treatment are listed below but will be constrained by the functional operational area i.e. the presence of any CBRN hazard. The priorities are:
  - a. Management of catastrophic haemorrhage (<C>).
  - b. Airway management (A).
  - c. Antidote (MedCM) administration (a) (see [Annex B](#) for an overview).
  - d. Breathing support and oxygen delivery, where possible (B).
  - e. Circulatory support (C).
  - f. Decontamination (and disability) (D).
  - g. Evacuation to the next level of care (Evac).

### 2.3. FUNCTIONAL ZONES OF CBRN CASUALTY CARE

1. Casualty care is split into zones based on the presence of contamination:
  - a. *Hot Zone* – this is an area where there is a hazard in the environment. Casualty care in this zone is limited to first aid only and delivered only to the most severe (T1 – triage category) casualties.
  - b. *Warm Zone* – this is a buffer (decontamination) area where there is a risk of contamination from personnel, equipment and casualties leaving the hot zone. Within this zone, medical personnel can perform emergency medical treatment. Within this zone, *casualty hazard management* also takes place (see below). Casualties leave the warm zone by crossing the *clean / dirty line* (CDL) into the clean or permissive zone.

2. The level of care is determined by the zone and is illustrated in Figure 2.1. Within the hot zone, casualty care is limited to first aid and is a unit responsibility as well as casualty evacuation. The forward casualty collection point is an extraction and focal point for the handover to medical personnel. Within the warm zone, medical personnel will deliver EMT and casualties will enter the medical evacuation (MEDEVAC) chain as well as casualty decontamination area (as required), before crossing the CDL.

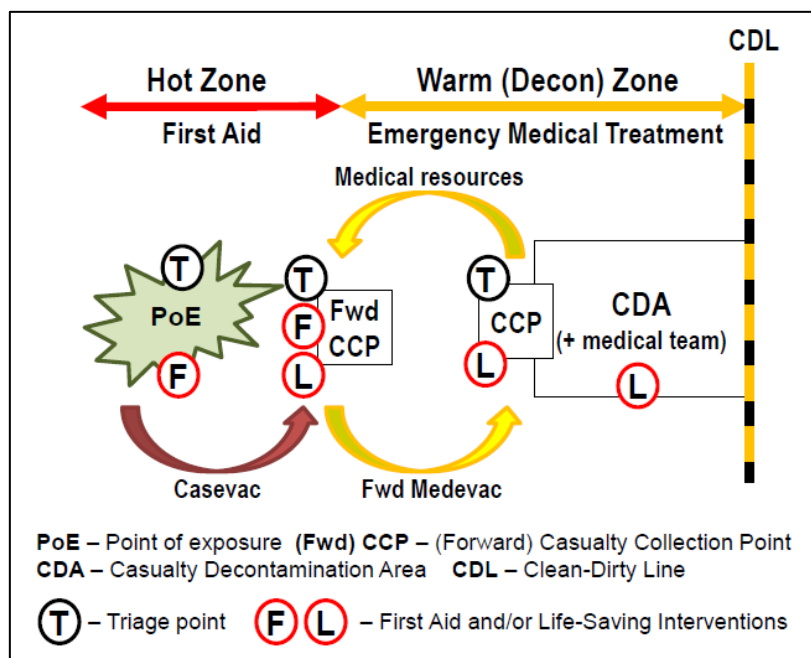


Figure 2-1 – CBRN First Aid Pathway.

## 2.4. PRIORITIES FOR CBRN FIRST AID

1. *Life-saving interventions.* The priorities for life-saving treatment in the hot zone follow the same as for conventional trauma but with the addition of antidote (immediate therapy MedCM) administration:

- <C> Management of *catastrophic* haemorrhage
- A Basic *airway* management
  - a *Antidote* (immediate therapy MedCM) administration
  - B *Breathing* support and oxygen delivery, where possible
- Evac** (Casualty) *Evacuation* to more permissive zone

**Note:** Circulation and decontamination are considered to be warm zone functions as part of EMT. However, in order to manage the airway and assess for life-threatening injuries, some decontamination especially around the head and neck ('*expose to treat*' procedure) may also be required, if safe to do so.

2. *Non-T1 interventions.* As well as life-saving interventions, self-aid may include the use of MedCM either to prevent the effects of exposure to a CBRN agent (post-exposure prophylaxis MedCM) or prevent deterioration if already unwell (immediate therapy MedCM). Details of specific MedCM are detailed in [Annex B](#).

3. *Wound management.* Any open wound may be considered as a route for exposure for CBRN agents. Any contaminated wound, whether conventional or CBRN, should be washed out as long as there is no risk of causing a clot to dislodge and cause catastrophic haemorrhage. Wound dressings, as well as stopping haemorrhage and providing protection, may also have a role to decontaminate and are described as part of CBRN casualty protective equipment (CPE) (see [Annex C](#)).

## 2.5. TRIAGE IN A CBRN-THREAT ENVIRONMENT

CBRN first aid ranges from the delivery of self-aid, buddy-aid to small unit level. However, it is possible that the provider may have multiple casualties. Triage (the sorting of casualties based on severity and hazard (contaminated or contagious)) is required for all casualties in a CBRN-threat environment as only the most severe (i.e. T1) require medical management in the hot zone. The reporting of a triage category is also a useful way of communicating the severity of the incident based on numbers and severity, and requirement for isolation and/or quarantine. In a CBRN incident the triage categories are adapted from those used for conventional incident management and described in Table 2-1.

**Table 2-1 - CBRN triage categories.**

Category	Term	Description
<b>T1</b>	<b>Immediate</b>	Requires life-saving interventions (LSI)
<b>T2</b>	<b>Delayed</b>	Stretcher casualty but not requiring LSI, or casualty is incapacitated (physically or mentally)
<b>T3</b>	<b>Minimal</b>	Walking and not incapacitated
<b>Dead</b>	<b>Dead</b>	Casualty declared or diagnosed as dead (see para. 2.5.2).

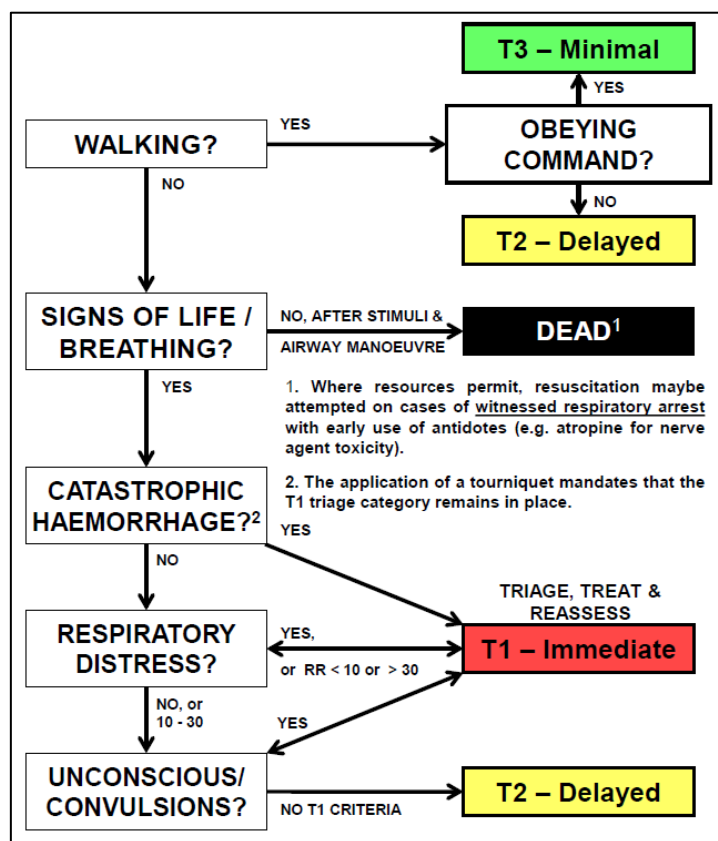


Figure 2-2 – Hot Zone Triage Sieve.

### 2.5.1. RECOGNITION OF THE T1 CASUALTY

1. Casualty management in the hot zone including first aid is limited to T1 casualties requiring life-saving interventions. A triage system must be simple and comprehensive until a specific agent is identified and agent-specific triage criteria may be used (see Chapter 3 Agent-specific First Aid Tables). Criteria for T1 triage category include:

- a. Catastrophic haemorrhage (or tourniquet in situ);<sup>3</sup>
- b. Obstructed airway (or required an airway manoeuvre);
- c. Respiratory distress (fast (>30 per minute), slow (<10 per minute) or irregular); and
- d. Unconscious or convulsions.
- e. Where heart rate monitoring is present, a heart rate < 40 or > 100 per minute.<sup>4</sup>

<sup>3</sup> *Lesson learnt.* On exercises, it has been observed that once casualties have a tourniquet in place and bleeding has stopped the triage category T2 is sometimes incorrectly applied. The application of tourniquet requires urgent reassessment at a medical facilities and the casualty should remain T1.

<sup>4</sup> The palpation of a pulse is unreliable for triage (and signs of life) in a CBRN environment while wearing IPE.

2. A triage sieve (algorithm) for use in the hot zone for both trauma and CBRN casualties is shown in Figure 2-2.

### 2.5.2. RECOGNITION OF DEATH

1. The level of recognition of death depends on the responder and national legal frameworks. In a CBRN environment, death may be:

- a. *Declared* by any responder based on injuries incompatible with life and stigmata of death such as rigor mortis;
- b. *Diagnosed* by any trained medical personnel based on the absence of life-signs and may include diagnostic equipment such as heart monitor; or
- c. *Confirmed* by any registered medical practitioner / doctor (or other regulated person depending on nation).

2. The recognition of death in a CBRN environment is challenging. Deaths in a conventional operational environment are normally declared either due to the presence of injuries incompatible with life, signs of death (rigor mortis) or following life-sign assessment and no breathing. In a CBRN environment, life-sign assessment will be more difficult. If there is uncertainty and resources allow, initial resuscitation should be started including immediate therapy MedCM.<sup>5</sup> Where there are multiple casualties, *the absence of a response to stimuli and no breathing* are the simplest and most rapid observations to enable timely triage and first aid to be delivered to other casualties, followed by a more formal assessment after all live casualties have been managed.

3. All casualties that have been triaged as dead must be labelled and ideally recorded with a minimum dataset. This prevents repeated assessments and triage of the same casualties by different responders. The minimum dataset is time, location and individual recognising death.<sup>6</sup> Death may need to be confirmed by a suitably trained medical personnel but depends on the operational threats during the initial stages of the response.

4. Further details on CBRN fatality management can be found in AMedP-7.1 Chapter 16 and supporting Annex. Fatality management is a Command and Logistics function within national (or potentially host nation) legal frameworks.

### 2.5.3. EXPECTANT CATEGORY (T4)

An additional triage category may be used by medical personnel, when a Mass Casualty (MASCAL) incident is declared. This is a situation where there are limited resources and is applied to casualties that require treatment using a disproportionate amount of resources, may be futile or is to the detriment of other casualties. These T4 casualties will be given palliative care or held until more resources are available. First aid providers would normally not be expected to use this triage category.

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<sup>5</sup>  *Lesson learnt.* 25% of simulated casualties with shallow breathing were assessed as dead while responders were wearing IPE.

<sup>6</sup>  *Lesson learnt.* The labelling of dead by the first person to triage the casualty has been a lesson identified following a number of conventional incidents and exercises.

**Note.** The T4 triage category is not to be used as an alternative to using DEAD. For some nations, this has legal implications and may also lead medical facilities to prepare to receive a casualty that is believed to be still alive.<sup>7</sup>

## 2.6. CASUALTY HAZARD MANAGEMENT

1. Casualty hazard management is the mitigation of the two main casualty hazards:
  - a. Contamination; and
  - b. *Contagious* (due to person-to-person transmissibility).
2. Casualty hazard management consists of:
  - a. *Contain* – this is the initial holding of personnel that may be exposed in a relatively safe area.
  - b. *Decontamination* – this includes immediate decontamination drills, the removal of clothing (disrobing) and a combination of dry followed by wet decontamination depending on the physical properties of the contaminant (i.e. gas, vapour, liquid or particulate). Casualty decontamination is generally divided into stretcher, walking and wound decontamination procedures.

**Note.** A T1 casualty may require an ‘*expose to treat*’ procedure focusing on the upper body, face and airway. This depends on the presence of a hazard and risk to the casualty’s airway and ‘effort of breathing’.

  - c. *Isolation* – this is the containment of unwell (symptomatic) contagious casualties.
  - d. *Quarantine* – this is the containment (and observation) of well (asymptomatic) persons that may have been in contact or exposed to a contagious patient or biological agent.
  - e. *Restriction of Movement (RoM)* – this is a Command decision to quarantine a unit or area to maintain operational effectiveness of the rest of the Force.
3. Once a casualty is out of the hot zone, casualty decontamination can take place. In some circumstances, after handing over to medical personnel, the first aid provider may then become the decontamination person (‘cutter’). A summary of casualty hazard management is given in Figure 2-2.

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<sup>7</sup>  *Lesson learnt.* The use of T4 by on scene responders has been seen on deployed operations and also on exercises (Exercise Clean Care 16). The latter resulted in extra resources allocated to respond to a casualty that had already died.

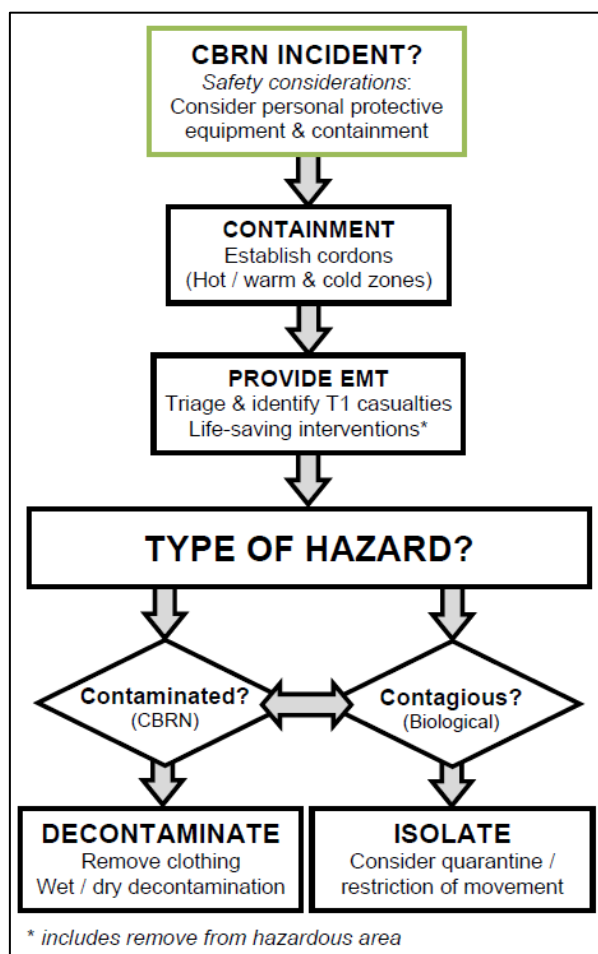


Figure 2-2 – Casualty Hazard Management.

### 2.6.1. CASUALTY DECONTAMINATION

1. Casualty decontamination is a continuum that can be split into stages. This includes:
  - a. Immediate (personal) decontamination.
  - b. Dry decontamination, if liquid contamination, followed by
  - c. Wet decontamination (or rinse).
2. Disrobing, the removal of clothing, may be considered part of immediate decontamination or dry decontamination.
3. The method of casualty decontamination will depend on the physical properties of the contaminant and the severity of the casualty. This is described in more detail in Chapter 6 of AMedP-7.1.



## **2.7. CASUALTY EVACUATION AND HANDOVER**

### **2.7.1. CASUALTY EVACUATION**

Casualty evacuation, as well as first aid provision, is a unit responsibility until handover to medical personnel. Casualty evacuation may be achieved either by self-extrication (escape) or rescue by responders including other unit personnel. Escape is the preferred option and is the most likely option for walking casualties. Where possible, non-walking (stretcher) casualties should be removed at the same time by any personnel able to move the casualties.

**Note.** In the absence of life-saving interventions, evacuation from the hot zone is the most important intervention.

### **2.7.2. CBRN CASUALTY PROTECTIVE EQUIPMENT (CPE)**

In some cases, a casualty may not have protective equipment or be able to wear IPE. CPE may be used to enable a casualty to be evacuated through a CBRN-threat environment. CBRN CPE is a suite of physical protective equipment intended to facilitate the evacuation of casualties in a CBRN-threat environment. The full suite is described in AMedP-7.1 Chapter 15: *Transport* and includes MEDEVAC equipment. CBRN first aid CPE includes respiratory and wound protective equipment and is described in more details in [Annex C](#).

### **2.7.3. CASUALTY HANDOVER (AT-MIST-D)**

Handover will normally take place at the hot / warm zone interface, described as a forward casualty collection point, a casualty decontamination area (CDA), ambulance exchange point (AXP) or medical treatment facility (MTF). Casualty handover and reporting is described in [Chapter 3](#).

### **2.7.4. CBRN CASUALTY REPORT FORM**

Where permissible, casualty information may be collected using the CBRN casualty report form. This is a dynamic document and may be adapted for specific operations and national MedCM capabilities. The generic form is shown in [Annex E](#).

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## CHAPTER 3: FIRST AID PROCEDURES IN A CBRN-THREAT ENVIRONMENT

### 3.1. RECOGNITION OF A CBRN INCIDENT

A CBRN event following recognition becomes a CBRN incident, requiring a response and recovery. Indications of a CBRN incident include:

- a. Any symptoms involving incident response or reconnaissance personnel;
- b. Multiple casualties with similar non-traumatic symptoms and signs;
- c. Unusual taste, smells or mist;
- d. Unexplained dead animals;
- e. Unexplained symptoms including:
  - (1) Altered vision
  - (2) Eye pain
  - (3) Headache
  - (4) Excessive secretions
  - (5) Chest tightness
  - (6) Difficulty in breathing
  - (7) Non-thermal burns
- f. Any unusual or unexpected symptoms, signs, illness or deaths.
- g. Abnormal patterns of disease.

### 3.2. IMMEDIATE ACTIONS FOLLOWING CBRN RECOGNITION

1. The initial actions, based on those for counter-improvised explosive devices (C-IED), are the 6Cs. They are summarised in Table 3-1 and are:

- a. *Confirm*. Where possible, a CBRN incident should be confirmed using visual assessment or appropriate detection equipment. Respiratory protection if available should be worn immediately followed by a warning to others such as “gas, gas, gas”. If the incident was recognised due to casualties, where possible, the route of exposure (food, water, air or skin) should be identified and reported.
- b. *Clear*. All personnel should clear the immediate area until a formal assessment has been made. The distance and safe direction will be determined by the incident type, type of hazard and wind direction. Where there may be an airborne hazard, the scene should be cleared either in an upwind direction if moving away from the hazard, or perpendicular to the wind direction if in or under a plume. For some hazards, e.g. explosives and radiation, an exclusion zone may be established.
- c. *Cordon*. Once the immediate area has been cleared, cordons should be established (physically, virtually or conceptually) to control entry/exit into the hazardous zone. A series of cordons around the scene will be based upon hazard and security constraints.

d. *Control*. Each zone within a cordon will have a commander under the overall command of the Incident Commander. It is vital to control entry and exit into a zone across a cordon as well as limit movement downwind. Within the cordons, eating, drinking and smoking may be restricted due to contamination. The scene should also be controlled in order to minimise any disruption to forensic evidence. Control measures may also require the recording of any potential exposures such as time in protective equipment and the wearing of radiation dosimetry.

e. *Communicate*. Command will be informed of the type of incident (explosive, chemical, biological, radiological and nuclear) and where possible the specific agent. Any incident update should include location, wind direction and casualty numbers using a METHANE or CBRN1 report.<sup>8</sup> The report format will be appropriate to the role of the person making the report (first responder, commander, medical personnel) and line of communication. It is vital that an initial report is made as an initial action to ensure the safety of other responders and the integrity of other units including the HQ and MTF.

f. *Contain*. In order to prevent secondary contamination and identify any early medical effects, a containment area should be established for personnel and equipment after clearing the immediate area. All personnel involved in the initial incident should be assessed by an appropriate person for potential exposure and contamination risk before being allowed to leave the scene. During the initial response to a sudden onset incident, there will be no risk of a contagious illness in those personnel exposed to a biological agent. Depending on the incident, the assessment does not need to be medical.

**Table 3-1 – Summary of the 6Cs Initial Actions.**

<b>Confirm</b>	<ul style="list-style-type: none"> <li>➤ Put on Individual Protective Equipment (where available)</li> <li>➤ Warn others nearby</li> <li>➤ Identify possible routes of exposure (e.g. food, airborne, skin)</li> </ul>
<b>Clear</b>	<ul style="list-style-type: none"> <li>➤ Move upwind, if gas, vapour or airborne particles</li> <li>➤ Move to a safe distance (outside any exclusion zone)</li> </ul>
<b>Cordon</b>	<ul style="list-style-type: none"> <li>➤ Establish hot and warm (decontamination) zone</li> <li>➤ Establish a formal clean / dirty line (CDL)</li> </ul>
<b>Control</b>	<ul style="list-style-type: none"> <li>➤ Stop any eating, drinking or smoking in contaminated area</li> <li>➤ Control and monitor re-entry and exit to / from zones</li> <li>➤ Limit movement downwind of hazard</li> <li>➤ Protect the area for further assessment including forensics (exploitation)</li> </ul>
<b>Communicate</b>	<ul style="list-style-type: none"> <li>➤ Inform Command using METHANE report and / or CBRN1 incident report</li> <li>➤ Warn local Medical Treatment Facilities and personnel</li> </ul>
<b>Contain</b>	<ul style="list-style-type: none"> <li>➤ Prevent secondary contamination, if persistent hazard</li> <li>➤ Prevent secondary infections, if <u>contagious</u> biological agent</li> </ul>

<sup>8</sup> The METHANE report is a standardised report based on My call sign, Exact location, Type of incident, Hazards, Access, Numbers of casualties, and Emergency response on scene or required. The CBRN1 report is the initial reporting of a suspected or confirmed CBRN incident and is detailed in ATP-45.

### 3.3. CBRN INCIDENT INITIAL REPORTING

CBRN incident reporting and requirements may vary between operations and reporting chain in place. *When in doubt, both chains should be used.* However, medical personnel are more likely to use the CBRN Methane Report format which emphasises casualty reporting, while CBRN operators will be trained to use the CBRN1 format. Both formats will require updates and subsequent CBRN-specific reports are detailed in ATP-45.

**Note.** The reporting in one format does not remove any operational requirement for a unit to also report using the alternate method. This will maximise a comprehensive operational response based on both CBRN and medical priorities.

#### 3.3.1. CBRN METHANE REPORT

The CBRN METHANE report (Table 3-2) is modified from the generic incident report format to include important information such as wind direction (thereby suggesting direction of access), and assessment of the scene and concurrent casualty assessment. SRD AMedP-7.2.1 provides a template and on scene tactical aide-memoire.

**Table 3-2 – CBRN METHANE Report.**

	<b>Subject</b>	<b>Subject</b>	
<b>1</b>	<b>My call sign</b>	My call sign & frequency	
<b>2</b>	<b>Exact location and wind direction</b>	Location of incident include approximate wind direction (use smoke as indicator)	
<b>3</b>	<b>Type of incident</b>	<b>A:</b> Deliberate release (Attack) <b>B:</b> Accident release (ROTA) <b>U:</b> Unknown	
<b>4</b>	<b>Hazards identified</b>	<b>U:</b> Unknown or: <b>C:</b> Chemical - Nil (0) / Suspect (1) / Probable (2) / Confirmed (3) <b>B:</b> Biological - Nil (0) / Suspect (1) / Probable (2) / Confirmed (3) <b>R:</b> Radiological - Nil (0) / Suspect (1) / Probable (2) / Confirmed (3) <b>E:</b> Explosives - Nil (0) / Suspect (1) / Probable (2) / Confirmed (3)	
<b>5</b>	<b>CBRN Assessment</b>	<b>A:</b> Scene Assessment including DIM (Detect) <b>B:</b> Casualty Assessment including signs & symptoms (Diagnose)	
<b>6</b>	<b>Number of casualties</b>	<b>T1:</b> Requiring life-saving interventions <b>T2:</b> Litter (Stretcher) or Incapacitated <b>T3:</b> Ambulatory (Walking) <b>D:</b> Dead <b>(T4:</b> Expectant (if authorised))	<b>X:</b> Exposed person (well) <b>C:</b> Contamination hazard
<b>7</b>	<b>Emergency resources</b>	Free text: Description of resources on scene and those required (including decontamination and access to stockpiles), and treatment given.	

#### 3.3.2. CBRN1 REPORT

Table 3-3 provides the outline for the reporting of CBRN incidents as detailed in ATP-45. A modified format for a nuclear detonation is found in the reference but is outside the scope of this publication. Lines highlighted in Bold are mandatory (M) while other lines will be operationally determined.

Table 3-3 – CBRN1 Initial Incident Report.

ALFA	Incident Serial Number ( <i>Command / HQ use</i> )
BRAVO	Location of Observer, and Direction of Travel (M)
DELTA	Date-Time-Group of Start and End of Incident (M)
FOXTROT	Location of Incident
GOLF	Delivery and Quantity Information (M)
INDIA	Release (and Sampling) Information on CBRN Incidents (M)
MIKER	Description and Status of CBRN Incidents (M)
TANGO	Terrain / Topography and Vegetation Description
YANKEE	Downwind Direction and Downwind Speed
ZULU	Measured Weather Conditions
GENTEXT	CBRN info

### 3.4. CASUALTY ASSESSMENT IN A CBRN-THREAT ENVIRONMENT

#### 3.4.1. 'QUICK LOOK'

'Quick Look' is a focused assessment of a casualty for trauma and chemical conditions and provides a structure for the provision of life-saving interventions (LSI) at the same time. *This must be achieved, if safe to do so, within the first ten minutes following exposure.* Casualty assessment may be supported by scene assessment with detection, identification and monitoring (DIM) equipment at the same time. A summary of the casualty assessment and treatment opportunities is shown as a CBRN first aid treatment flow chart in Figure 3.1.

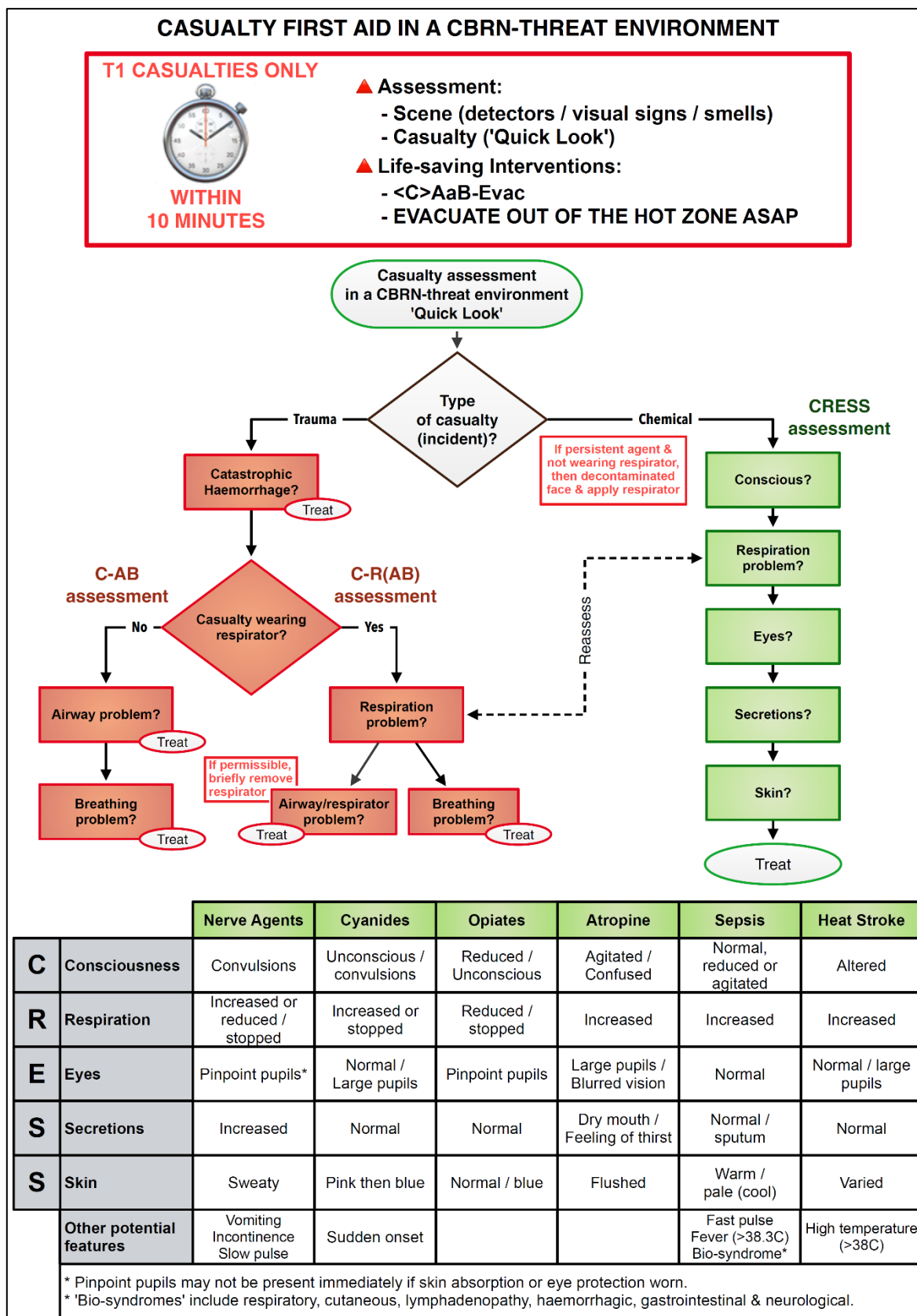
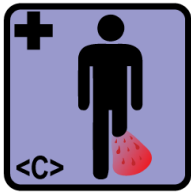


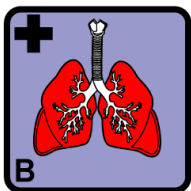
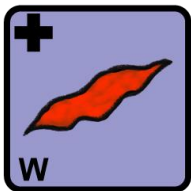


Figure 3-1 – CBRN First Aid Flow Chart.

Table 3-4 – General and Trauma-Related First Aid in a CBRN-threat Environment.

<p><b>CATASTROPHIC HAEMORRHAGE</b></p> 	<ul style="list-style-type: none"> <li>➤ Attempt to apply pressure dressing, if unsuccessful: <ul style="list-style-type: none"> <li>– <b>If limb injury</b> apply tourniquet (where available).</li> <li>– <b>If torso injury</b> manage as conventional catastrophic haemorrhage.</li> </ul> </li> <li>➤ Apply appropriate dressing / markings to protect and notify medical personnel of any potential residual wound contamination.</li> </ul>
<p><b>IF CASUALTY WEARING RESIRATOR <u>AND SAFE TO DO SO</u></b>  <b>CARRY OUT 'EXPOSE TO TREAT' PROCEDURE</b>  Decontaminate around the respirator and the hood  Loosen Individual Protective Equipment  Remove respirator (<i>do not discard as it may be required again</i>)</p>	
<p><b>AIRWAY</b></p> 	<ul style="list-style-type: none"> <li>➤ Basic airway manoeuvres, such as: <ul style="list-style-type: none"> <li>– Head tilt &amp; chin lift (non-trauma)</li> <li>– Jaw thrust (trauma)</li> </ul> </li> <li>➤ Suction airway, if equipment available, or else self-drainage</li> <li>➤ Place in recovery (semi-prone) position, if unconscious or excess secretions</li> </ul>
<p><b>ANTIDOTES</b></p> 	<p><b>REFER TO AGENT-SPECIFIC FIRST AID</b></p>
<p><b>BREATHING</b></p> 	<ul style="list-style-type: none"> <li>➤ RIBS assessment (rate, injuries, back and sides)</li> <li>➤ Breathing support and ventilation, as resources allow <ul style="list-style-type: none"> <li>– <b>If sucking chest wound</b>, apply appropriate dressing</li> <li>– If low oxygen level (or blue), give oxygen (if available)</li> <li>– <b>If penetrating chest injury</b>, consider tension pneumothorax – seek medical help as soon as possible</li> </ul> </li> </ul>
<p><b>WOUND</b></p> 	<ul style="list-style-type: none"> <li>➤ If catastrophic haemorrhage, manage as described above</li> <li>➤ <b>If no catastrophic haemorrhage</b>, irrigate wound with copious amounts of water or saline and avoid dislodging any clot.</li> <li>➤ <i>Apply appropriate dressing to protect and notify medical personnel of any potential residual wound contamination.</i></li> </ul> <p><b>Note.</b> Where there is limited sterile saline, consider using bottled or chlorinated drinking water, followed by a sterile rinse. Avoid introducing decontamination products into the wound unless licensed to wound decontamination.</p>

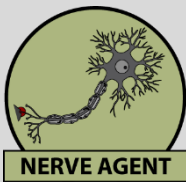



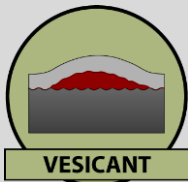

### 3.4.2. TRAUMA ASSESSMENT

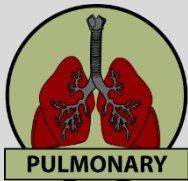

Treatment during first aid depends on the type of incident and whether the casualty is wearing a respirator i.e. is it possible to assess the airway? Following the trauma side of the Quick Look flowchart, as a life-threatening condition is identified, it is treated. Specific traumatic conditions are listed in Table 3-4, but battlefield trauma first aid guidance should also be referred to.

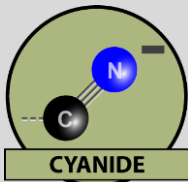

### 3.5. CHEMICAL AGENT AND CBRN (CRESS) ASSESSMENT



The chemical side of the flow chart, in green, requires a full assessment of the casualty to be completed before deciding on the lethal agent, if one is identified. This is completed by looking at **C**onscious level, **R**espirations, **E**yes, **S**ecretions and **S**kin and is called the CRESS assessment. Key chemical agents to identify include those with antidote or agent-specific management (nerve agent and cyanide (blood agent)), or due to other drugs i.e. atropine toxicity or opiate (morphine-type agents) overdose. Chemical agent-specific management is detailed below.

		<b>TABLE 3-5 (a) – NERVE AGENTS</b> (e.g. tabun, sarin, soman and VX)		
		<b>Mechanism of action:</b> Nerve agents cause over-stimulation of parts of the nervous system and lethal effects. This is due to increased levels of the neurotransmitter <i>acetylcholine</i> due to inhibition of the enzyme <i>acetylcholinesterase</i> by the nerve agent.		
<b>CRESS ASSESSMENT</b>				
Consciousness	Respiration	Eyes	Secretions	Skin
Convulsions Unconscious	Increased → Reduced / Stopped	Pinpoint pupils	Increased	Sweating
Other features	Slow heart rate, vomiting, incontinence For skin exposure – localised muscle twitching, delayed pinpoint pupils DUMBELS (diaphoresis (sweating), urination, miosis (pinpoint pupils), bradycardia, emesis (vomiting), lachrymation (tears), sweating)			
<b>SEVERITY OF EFFECTS – TRIAGE</b>				
Severe (T1)	Moderate (T2)	Mild (T3)		
Unconscious, convulsions, respiratory distress, respiratory paralysis / arrest, very slow heart rate < 40, cyanosis (blue).	Not walking. Excessive secretions, confusion, not obeying commands, wheezing, vomiting, diarrhoea.	Walking. Pinpoint pupils, dimmed vision, eye pain.		
		<ul style="list-style-type: none"> <li>✦ Remove from scene</li> <li>✦ Immediate decontamination</li> <li>✦ Clear secretions and vomit (suction airway, if equipment available)</li> <li>✦ Nerve Agent Antidote as auto-injector or equivalent (see AMedP-7.2 <a href="#">Annex B</a>)</li> <li>✦ Place in recovery (semi-prone) position</li> </ul>		

 <b>TABLE 3-5 (b) – VESICANTS (BLISTERING AGENTS)</b> (e.g. sulphur mustard, Lewisite)				
<b>Mechanism of action:</b> <b>Sulphur mustard</b> – Damage to DNA and other biological molecules resulting in cell death of exposed tissue including skin, airway and lungs. <b>Lewisite</b> – Arsenic (lethal) poisoning causing acid type burns and systemic toxicity.				
GRESS ASSESSMENT				
Consciousness	Respiration	Eyes	Secretions	Skin
Normal	Normal or increased	Inflamed	Normal or mildly increased	Inflamed (reddened) → Blisters
<b>Other features</b>		<b>Onset:</b> Sulphur mustard has delayed onset with reddening followed by blisters (6 - 24 hrs); Lewisite effects are immediate, painful and possible silvery grey lesions.		
SEVERITY OF EFFECTS – TRIAGE				
Severe (T1)		Moderate (T2)	Mild (T3)	
Airway burns / obstruction, burn surface area (sulphur mustard > 25%; lewisite > 5%), respiratory distress.		Not walking. Burn surface area (sulphur mustard 10-25%), airway irritation, hoarse voice, cough; eye pain AND reddening.	Walking. Reddened skin, eye pain.	
 <b>Immediate pain</b> – consider Lewisite or caustic agent (acid / alkali) <b>Delayed redness (6-12 hours)</b> – consider sulphur mustard + Remove from scene and immediate decontamination drills + Monitor exposed area for redness and irritation, especially eyes and airway + Report any difficulty with breathing or swallowing, including hoarse voice or cough				

 <b>TABLE 3-5 (c) – PULMONARY (CHOKING) AGENTS</b> (e.g. chlorine, phosgene, ammonia, hydrogen sulphide)				
<b>Mechanism of action:</b> Direct irritation of airways. Damage to cell membranes of the respiratory tract and lungs either directly or by the formation of free radicals.				
GRESS ASSESSMENT				
Consciousness	Respiration	Eyes	Secretions	Skin
Agitated	Increased	Normal, or inflamed (chlorine)	Respiratory secretions ± blood	Normal → Blue (cyanosed)
<b>Other features</b>		<i>Chlorine</i> – smell of swimming pool and immediate discomfort. <i>Phosgene</i> – smell of freshly mown hay, immediate discomfort only at high concentrations. Phosgene effects may be delayed (up to 12-24 hours depending on concentration) or worsen with exertion.		
SEVERITY OF EFFECTS – TRIAGE				
Severe (T1)		Moderate (T2)	Mild (T3)	
Respiratory distress, blue or pale (grey white) skin, unconscious.		Not walking. Persistent cough ± blood.	Walking. Eye pain, airway irritation.	
 + Remove from scene; avoid exertion + If respiratory distress AND hazard cleared, remove respirator + If liquid contamination or T1, remove clothing + Basic airway management including head tilt and chin lift + If respiratory secretions, allow free drainage in recovery (semi-prone) position + If cyanosed (blue), give oxygen if available				

	<b>TABLE 3-5 (d) – CYANIDES (BLOOD AGENT)</b> (e.g. hydrogen cyanide, cyanogens)				
	<b>Mechanism of action:</b> Cyanide stops cells in the body from using oxygen resulting in sudden lactic acidosis, loss of consciousness and death.				
<b>CRESS ASSESSMENT</b>					
<b>Consciousness</b>	<b>Respiration</b>	<b>Eyes</b>	<b>Secretions</b>	<b>Skin</b>	
Unconscious / convulsions	Increased → stopped	Normal → large pupils	Normal	Pink → blue (cyanosed)	
<b>Other features</b>		Sudden / rapid onset			
<b>SEVERITY OF EFFECTS – TRIAGE</b>					
<b>Severe (T1)</b>		<b>Moderate (T2)</b>		<b>Mild (T3)</b>	
Unconscious, convulsions. Hyperventilation (blue skin), respiratory distress, respiratory arrest.		Not walking. Confusion, history of loss of consciousness, hyperventilation (pink skin).		Walking. Nausea, dizziness, mild agitation.	
	<ul style="list-style-type: none"> <li>✦ Remove from scene immediately</li> <li>✦ If breathing and symptomatic, give oxygen (if available)</li> <li>✦ Start cardiopulmonary resuscitation if cardiac arrest witnessed or within 10 minutes (<i>avoid mouth to mouth resuscitation</i>)</li> <li>✦ Administer cyanide immediate therapy MedCM, where available</li> </ul>				

	<b>TABLE 3-5 (e) – ATROPINE OVERDOSE OR MENTAL (PSYCHOTROPIC) INCAPACITANTS</b> (e.g. 3-quinuclidinyl benzilate (BZ), D-lysergic acid diethylamide (LSD))				
	<b>Mechanism of action:</b> Atropine and some mental incapacitating agents cause alterations to the central system and non-muscle parts of the nervous system. This causes hallucinations, peripheral effects and risk of heat illness. (*)				
<b>CRESS ASSESSMENT</b>					
<b>Consciousness</b>	<b>Respiration</b>	<b>Eyes</b>	<b>Secretions</b>	<b>Skin</b>	
Agitated / Confused	Increased	Large pupils / Blurred vision	Dry mouth / Feeling of thirst	Flushed / Dry skin	
<b>Other features</b>		Effects may be caused or mistaken for heat illness including dehydration and heat stroke.			
<b>SEVERITY OF EFFECTS – TRIAGE</b>					
<b>Severe (T1)</b>		<b>Moderate (T2)</b>		<b>Mild (T3)</b>	
Unconscious, extreme agitation or violent behaviour, convulsions, chest pain. Temp > 40°C.		Not walking. Confusion, not obeying command, hallucinations. Temp > 39°C.		Walking. Dry mouth, blurred vision, mild agitation.	
	<ul style="list-style-type: none"> <li>✦ Remove any weapons from casualty</li> <li>✦ Remove from scene, if chemical agent</li> <li>✦ Immediate decontamination, if chemical agent</li> <li>✦ Reassure casualty, and avoid physical restraint due to risk of heat illness</li> <li>✦ Manage in a cool, calm and sheltered environment</li> </ul>				

### 3.6. BIOLOGICAL AGENT-RELATED FIRST AID

Biological agents have a longer onset period (latency) compared to chemical agents as described in AMedP-7.1. An illness due to a biological agent (BA) should be suspected if there is a raised temperature (pyrexia) and associated 'bio-syndrome'. The seven bio-syndromes and initial prodrome are shown with their related symptoms in Figure 3-2.

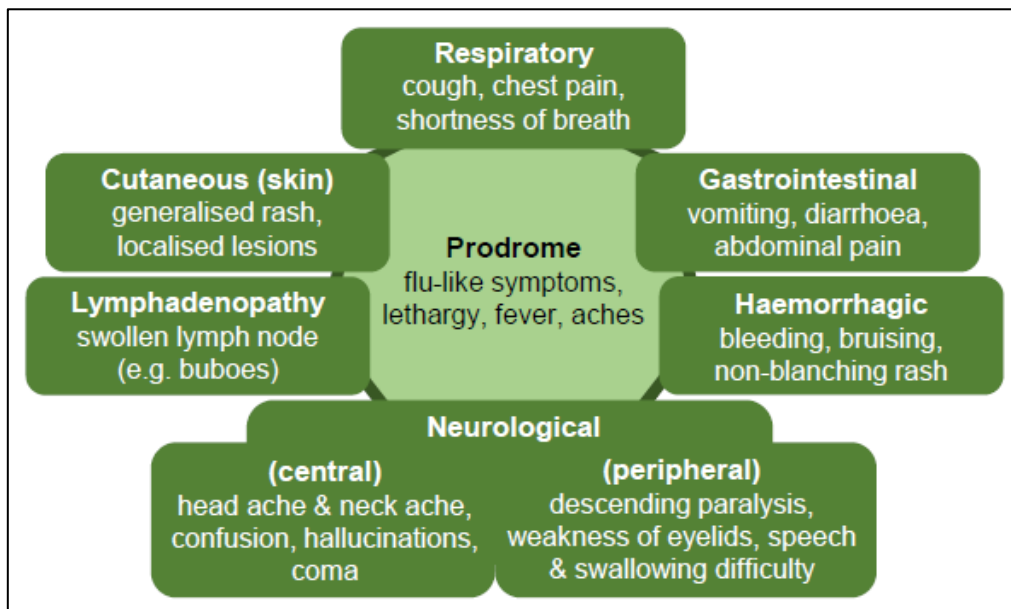


Figure 3.2 – Biological Syndromes.

#### 3.6.1. ASSESSMENT OF A BIOLOGICAL CASUALTY

In addition to a temperature and bio-syndrome, a severe (T1) infection ('sepsis') should be considered and reported to medical personnel as soon as possible, if two of the following are present:

- a. Respiratory rate > 22 per minute;
- b. Blood pressure < 100mmHg (or weak / no radial pulse);
- c. Altered conscious level; or
- d. Non-blanching rash.<sup>9</sup>

#### 3.6.2. MANAGEMENT OF A BIOLOGICAL CASUALTY

The initial management of a biological casualty includes:

- a. *Safety* – Assessment of the risk of person-to-person transmission (contagious disease) followed by:
  - (1) Wearing appropriate protective equipment; and
  - (2) Establishing isolation either by distance or physical separation.

<sup>9</sup> A rash is assessed by applying pressure to the skin (ideally with a glass) for five seconds and releasing. If there is no effect due to the pressure on the skin, the rash is described as non-blanching.

- (3) Consider contact tracing and quarantining personnel with exposure risk.
- b. *Casualty triage / assessment* – Casualty management for biological should be focused on the T1 casualty although early medical review for all infections is recommended:
- (1) Monitoring vital signs including pulse rate, respiratory rate, temperature and level of consciousness.
  - (2) Identifying the type of biological syndrome (see Figure 3-2).
- c. *Casualty treatment* – Depending on the severity of illness, and where required:
- (1) **If sepsis**, start the ‘Sepsis-3’ (intravenous fluids, oxygen, and intravenous antibiotics – as appropriate and scope of practice).
  - (2) Give an anti-pyretic to control fever.
  - (3) Rehydrate orally (‘little and often’), if intravenous is not possible, and
  - (4) Give antibiotics as directed by medical personnel (usually oral, if intravenous is not possible).
- d. *For prolonged field care* – Monitor markers of hydration including conscious level, pulse, and urine colour and output (based on 0.5 ml/kg/hr over appropriate time (i.e. 80kg person should produce a minimum volume of 240mls if 6 hours intervals).
- e. *Communicate* - Report findings and seek advice from medical personnel until handover.

### 3.7. RADIATION-RELATED FIRST AID

1. Radiological incidents, excluding nuclear detonations and accidents, are likely to be irradiation only (e.g. point exposure), exposure and contamination (e.g. damaged orphan source), or combined with trauma (radiological dispersal device (‘dirty bomb’)). While radiation exposures may vary between incidents and individual cases, very high exposures resulting in acute radiation injury (whole body or local) are very unlikely. This risk can be further mitigated by the appropriate deployment of radiation DIM equipment.
2. The priorities for immediate management of radiological casualties:
  - a. *Safety* – Assess the on scene hazard from high dose rate radiation exposure and any contamination. Reduce risk of irradiation by use of *time, distance, shielding and control measures*. This includes the 6C and establishing a cordon based on dose rate.
  - b. *Triage* – Identify any T1 casualties primarily based on the presence of trauma with or without a high dose radiation exposure (> 2 Gray).<sup>10</sup>
  - c. *Casualty assessment* – Identify and manage any life-threatening trauma (see Table 3-4) and assess for any prodromal symptoms or signs.
  - d. *Dose assessment*.

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<sup>10</sup> A Gray (Joules per kilogramme) is a measurement of absorbed radiation dose used to assess the risk of acute radiation syndrome and local radiation injury (deterministic effects).

- (1) Record any physical / personal dosimetry.
- (2) Record the proximity and duration near to known source.
- (3) Record the onset time of any nausea, vomiting and / or diarrhoea.
- (4) Record any use of anti-sickness or stable iodine medication.

**Note.** The first priority for the management of a combined radiological and trauma casualty is to treat any life-threatening trauma first (i.e. <C>-ABC).

### 3.8. HEAT-RELATED FIRST AID

1. Heat illness may present in a number of ways ranging from thirst through to heat stroke. It includes heat rash, heat cramps, heat syncope and heat exhaustion. Heat stroke is the most severe form and is a life-threatening condition. It is associated with altered brain function (confusion, convulsions and unconsciousness) due to a high core body temperature (>40°C).

**Note.** Heat illness including heat stroke may occur in cold climates especially in IPE and with physical exertion.

2. The initial actions on suspecting a heat stroke casualty is:
  - a. Stop activity, and check for any use of atropine (nerve agent antidote).
  - b. Evacuate to a cooler environment (consider shade or basement area).
  - c. Relax IPE state, if permissible.
  - d. Strip, soak, fan and fluids (SSFF), if permissible.
  - e. Rehydrate but avoid drinking large volumes ('little and often').
  - f. Record any altered level of conscious, confusion or agitation.
  - g. Record core body temperature, where possible.
  - h. Consider the risk of heat injury in other members of the unit.

3. Cooling is the normal management of a heat casualty in a conventional environment; in a CBRN environment this is a challenge. The greatest thermal burden is the IPE suit rather than the respirator and as a compromise this could be relaxed depending on the immediate CBRN threat. If the CBRN threat is high, finding shelter or CASEVAC should be a priority so as not to compromise IPE, although drinking cool fluids should be encouraged.

### 3.9. PSYCHOLOGICAL CASUALTIES

In a CBRN-threat operational, the risk of psychological casualties will be increased due to a number of reasons. These may due to the:

- a. Direct effects of the CBRN agent such as mental incapacitating agents;
- b. Indirect effects such as IPE degradation causing heat injury or claustrophobia;
- c. Reactive, in response to a confirmed or suspected exposure to a CBRN agent; or

- d. Psychogenic (or sociogenic), where there is no agent exposure but symptoms are experienced by individuals or groups respectively.

### 3.9.1. SIGNIFICANT CAUSES FOR PSYCHOLOGICAL ILLNESS IN A CBRN-THREAT ENVIRONMENT

1. Symptoms and signs of psychological dysfunction may be rapid onset or insidious, and there is a spectrum described as the mental health continuum model (healthy – reacting – injured – ill). A battle stress reaction (BSR) is a disorder of psychological function which is a normal response to an abnormal situation experienced *during combat*, and which may cause a temporary inability to perform duties [AMedP-8.6].

**Note.** In a CBRN-threat environment, BSR is a diagnosis of exclusion until other life-threatening conditions have been ruled out.

2. Potentially life-threatening or reversible conditions with psychological dysfunction include:
- Direct effects of a chemical agent including mental incapacitants.
  - Use of MedCM (incorrect use, overdose or side effect), including atropine.
  - Heat illness especially heat stroke.
  - Delirium due to an infection (usually associated with temperature).
  - Claustrophobia due to wearing IPE (a sub-group of BSR).

### 3.9.2. PSYCHOLOGICAL TRIAGE IN A CBRN ENVIRONMENT

The initial management of a casualty and urgency will depend on a number of factors. Some criteria may assist with initial triage and decision making in a CBRN environment. As part of the all-hazards approach, the same triage categories may be used and incapacitation is already a criterion in the generic CBRN triage sieve / algorithm. Table 3-6 provides guidance for each category.

**Table 3-6 - CBRN psychological triage categories.**

Category	Term	Description
<b>T1(Ψ)</b>	<b>Immediate</b>	Behaviour is an immediate risk to self or others
<b>T2(Ψ)</b>	<b>Delayed</b>	Casualty is physically or mentally incapacitated and/or unable to function (may still be walking)
<b>T3(Ψ)</b>	<b>Minimal</b>	Anxious / reacting but able to function but requires unit or medical intervention
<b>Unclassified</b>	<b>Exposure risk</b>	Exposed to a 'Potentially Traumatic Event'. Does not require intervention but may be registered as 'at risk' depending on national health surveillance policies. This may also include responders and body handlers / mortuary affairs.

### 3.9.3. INITIAL MANAGEMENT OF PSYCHOLOGICAL CASUALTIES

1. The management of psychological casualties is described in detail in AMedP-8.6. It details the management as a layered approach consisting of:

- a. Level 1 – Self and buddy help (unit level aid) underpinned by proximity, immediacy and expectancy including return to duty.
  - b. Level 2 – Consultation with psychological support professions or trained peers (primary health care, forward mental health team).
  - c. Level 3 – Treatment by psychological support professionals.
2. The initial management of psychological casualties is to rapidly assess the casualty and the situation for potential causes. Irrespective of the causes, immediate actions include:
- a. Remove any weapon system and ensure casualty is safe.
  - b. Assess and manage any life-threatening trauma, heat or chemical exposure.
  - c. Triage casualties with severe symptoms to the most appropriate care provider (unit, forward mental health team or medical facility) (see Table 3-6).
  - d. Manage all non-urgent, self-caring and compliant psychological casualties, where possible, within the unit to prevent medicalisation of the reactions which may be normal or appropriate to the precipitating event, and avoid evacuation.
  - e. Some exposed persons may only require self-referral advice. They should be provided with information on normal reactions as well as indications to seek further help and who to approach (unit, forward mental health team, medical officer or other person). This may also be supported by post-incident risk communication including informed advice of future risks of mental and physical disease e.g. contextual cancer and genetic risk following a radiation exposure which may be even be reassuring. Any exposed person should still be recorded as part of health surveillance.

### 3.10. CASUALTY HANDOVER

The casualty handover follows a standardised format also used for trauma casualties and is detailed as a NATO format in Table 3-7 with a more detailed CBRN casualty report form in [Annex E](#). The handover consists of:

- A** Age (or adult)
- T** Time of incident, injury or exposure
- M** Mechanism of injury / exposure
- I** Presence of Injuries, Intoxication, Infection or Irradiation (4Is)
- S** Symptoms and signs including any vital signs
- T** Treatment given
- D** Decontamination status (no contamination, residual contamination, wound)



Table 3-7 – AT-MIST Report.

<b>Identification:</b>			
		(If known)	
<b>A</b>	<b>Age of casualty</b> (adult / child (+ age))		
<b>T</b>	<b>Time of wound / exposure or time of onset of symptoms</b>		
<b>M</b>	<b>Mechanism of injury or type of incident</b>		
<b>I</b>	<b>Injuries</b>	<b>Intoxication</b>	<b>Infection</b>
	(including injury pattern & observed injuries)	(type, route of exposure, & contamination risk)	<b>Irradiation</b> (including any dosimetry)
<b>S</b>	<b>Symptoms and signs</b> (including toxidromes)		<b>Other:</b>
	<b>C</b> at haem:	<b>C</b> onsciousness	
	<b>A</b>	<b>R</b> esp	
	<b>B</b>	<b>E</b> yes	
	<b>C</b> irc	<b>S</b> ecretions	
<b>D</b>	<b>S</b> kin		
<b>T</b>	<b>Treatment given:</b>	<b>NA antidotes</b>	<b>Other MedCM:</b>
			Auto-injector
			Atropine
			Oxime
		Anticonvulsant	
<b>D</b>	<b>Decontamination status:</b>		
	(no contamination; fully decontamination; wound contamination; internal hazard)		

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## ANNEX A – CBRN FIRST AID TRAINING REQUIREMENTS

### A.1. INTRODUCTION

1. Training of first aid in a CBRN-threat environment to non-medical personnel may be delivered at two levels:
  - a. Basic (Generalist) CBRN First Aid.
  - b. Enhanced CBRN First Aid.
2. Both levels require a providers to:
  - a. Recognise a CBRN casualty or incident.
  - b. Use self-administered immediate therapy MedCM.
  - c. Recognise and initially manage atropine overdose.
  - d. Manage life-threatening conditions (e.g. airway obstruction) in a CBRN-threat environment.
  - e. Recognise and manage heat illness in a CBRN-threat environment especially when wearing IPE.
  - f. Handover to medical personnel.
3. Enhanced CBRN First Aid includes the above, but also includes:
  - a. Deliver chemical agent-specific first aid.
  - b. Management of life-threatening trauma (<>C-AB) in a CBRN-threat environment.
  - c. Recognise and initially manage a severe biological casualty (sepsis).
  - d. Recognise acute radiation syndrome and local radiation injury including the reporting of any radiation exposures or dosimetry.
  - e. Recognise and initially manage psychological casualties.
  - f. Operate CBRN casualty protection equipment, as required.
  - g. Support casualty decontamination (T1 casualties), as required.
4. Individual scopes of practice are a national responsibility but a basic level of CBRN first aid is expected for all personnel deploying on CBRN Defensive Operations and/or where CBRN immediate therapy has been deployed and distributed.

### A.2. CBRN FIRST AID COMPETENCY FRAMEWORK

5. The Training Objectives (TO) and associated tasks (standards) are listed below for the provision of basic / generalist (gen) and enhanced (enh) CBRN first aid including battlefield trauma and chemical first aid (see Figure A-1). This may contribute to national Role (Operational) Performance Statements (RPS/OPS) and are consistent with the five TO described in AMedP-7.3:

CBRN First Aid Training Objectives	Role	
	Gen	Enh
<p><b>1. Manage any casualty in a CBRN-threat environment (basic level)</b> The CBRN first aid provides should be able to:</p> <p>1.1 Recognise a CBRN casualty or incident</p> <p>1.2 Carry out personal safety procedures</p> <p>1.3 Assess a casualty in a CBRN environment</p> <p>1.4 Treat life-threatening CBRN and traumatic conditions (including heat stroke)</p> <p>1.5. Perform casualty hazard management (T1 decontamination) (as required)</p>	✓	✓
<p><b>2. Manage the medical aspects of a CBRN incident (basic level)</b> The CBRN first aid provides should be able to:</p> <p>2.1 Identify any on-scene CBRN hazards</p> <p>2.2 Mitigate any on-scene CBRN hazards (scene safety – ‘6Cs’)</p> <p>2.3 Triage casualties in a CBRN environment (identify the T1 casualty)</p> <p>2.4 Handover casualty to medical personnel</p>	✓	✓
<p><b>3. Manage a chemical casualty (basic level)</b> The CBRN first aid provides should be able to:</p> <p>3.1 Assess a casualty for life-threatening chemical intoxication</p> <p>3.2 Treat a casualty with life-threatening chemical intoxication</p>	Self*	✓
<p><b>4. Manage a biological casualty including sepsis (awareness)</b> The CBRN first aid provides should be able to:</p> <p>4.1 Recognise signs of life-threatening or significant biological exposure</p>		✓
<p><b>5. Manage a radiological casualty including nuclear (awareness level)</b> The CBRN first aid provides should be able to:</p> <p>5.1 Recognise signs of acute radiation exposure or local radiation injury</p> <p>5.2 Treat a combined radiological casualty (manage trauma)</p>		✓

\*Self refers to Self-Administered Immediate Therapy MedCM.

(✓) refers to variation between nations and scope of practice for basic CBRN first aid providers.

6. The conditions that the training objectives and standards should be taught to include:
  - a. In the pre-hospital operational environment.
  - b. At a Casualty Decontamination Area.
  - c. At a Role 1 Medical Facility.
  - d. Using CBRN first materials described in Annex B.
  - e. In the land, maritime and air operational environment.
  - f. During day and night.
  - g. In all climatic conditions.
  - h. As an individual or as part of a team.

### **A.3. CBRN FIRST AID TRAINING DELIVERY METHODS**

The delivery of CBRN first aid will vary between nations, roles and operations. The following are recommendations but are not exclusive. Individual training is a national responsibility and includes national MedCM capabilities.

#### **A.3.1. BASIC (GENERALIST) CBRN FIRST AID TRAINING**

This level of first aid training may be combined with other CBRN basic training. Recommended training delivery methods include:

- a. Annual CBRN training (linked to IPE and other drills).
- b. Pre-deployment training.
- c. On issuing of immediate therapy MedCM.
- d. Distributed learning (e-Learning).

**Note.** Nations should avoid the delivery of CBRN first aid training within the Joint Operational Area (unless at a safe staging area) due to the potential targeting of points of disembarkation and risk to untrained personnel.

#### **A.3.2. ENHANCED CBRN FIRST AID TRAINING**

This level of first aid training may be combined with other CBRN basic training. Recommended training delivery methods include:

- a. Special-to-role training.
- b. Pre-deployment training.
- c. Broader enhanced medic training package including trauma, disease, CBRN and prolonged field care.

#### **A.3.3. COLLECTIVE TRAINING AND EXERCISES**

Collective training is vital for communications and interoperability. Key areas in the casualty chain for lessons identified include handover points between non-medical and medical personnel, as well as different national capabilities. Training and tactical aide-memoires with standardised reporting formats should be utilised to support general communication and the transmission of key casualty information including the severity of the casualty, mechanism of injury, treatment given and safety issues.<sup>11</sup>

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<sup>11</sup>  *Lesson learnt.* Communications and Interoperability were the two most frequent observations on Ex Clean Care 16 and most comments were focussed around the CDA. This is a major challenge for casualty handover and requires a multi-national approach that includes individual and collective training.

	Hot Zone	Warm Zone	Clean Zone
Generalist	Basic CBRN First Aid		
Enhanced Generalist CBRN Specialist	Enhanced CBRN First Aid		
Special Operations Forces Operative			Prolonged Field Care
Medical personnel		CBRN Emergency Medical Treatment	Advanced Medical Care

**Figure A-1 – CBRN First Aid Competencies.**

## ANNEX B – CBRN FIRST AID MATERIEL REQUIREMENTS

### B.1. INTRODUCTION

The following items are recommendations for planning the medical response including CBRN first aid provision. Specific MedCM are a national responsibility but should be declare to Allied Nations in order to optimise interoperability and minimise adverse drug reactions.

- a. Triage Equipment
- b. Casualty Decontamination Materiel
- c. CBRN Agent-Specific and Supportive MedCM
- d. CBRN First Aid Equipment
- e. CBRN Casualty Protective Equipment
  - (1) CBRN Casualty Respiratory Protection
  - (2) CBRN Wound Dressing
- f. CBRN First Aid Training Materiel

### B.2. TRIAGE EQUIPMENT

1. Recommended triage equipment for use in a CBRN-threat environment includes:
  - a. CBRN Triage Aide-Memoire.
  - b. Monitoring equipment to support life-sign and vital sign assessment (see below).
  - c. Equipment to label a live casualty including triage category (T1 Immediate (Red), T2 Delayed (Yellow) and T3 Minimal (Green)) and any immediate treatment given.
  - d. Equipment to label a fatality (Dead (Black)) including time, location and identification of person recognising death.
  - e. Equipment to label an expectant (T4), for medical (or other) personnel only.
2. Optional equipment includes:
  - a. Communication and information management equipment / software to support the transmission of triage and casualty information.
  - b. Recording equipment to support fatality recognition and management including Global Positioning System recording, image and video recording.

### B.3. CASUALTY DECONTAMINATION MATERIEL

1. Casualty decontamination includes suitable materiel for the physical removal or neutralization of nerve and vesicant (blistering) agents. A single substance capable of removing and neutralizing agents is the ideal, if available. Otherwise, separate substances may be used.

2. It is recommended that all substances used for casualty decontamination should:
  - a. Be issued in sufficient quantity to neutralize rapidly, by removal or inactivation, the toxic liquids and/or solids which cover the parts of the body exposed to chemical agents, personal weapons and, whenever possible, personal equipment.
  - b. Be sufficiently stable to allow storage for at least 5 years.
  - c. Be packed in an air and water tight container ready for immediate use.
  - d. Be easily removable from the skin after use, with ideally plain water.
3. Any casualty decontamination materiel must be:
  - a. Safe to use on naked skin or personal equipment that could touch skin.
  - b. Safe to apply around wounds without causing systemic absorption and adverse effects.
  - c. Safe if applied, deliberately or accidentally, into an open wound. Some decontaminant may have wound decontamination properties but use will be a national responsibility including notification of other nations of any specific rinsing, neutralisation or surgical management required after use.

#### **B.4. CBRN AGENT-SPECIFIC MEDCM**

##### **B.4.1. NERVE AGENT PRE-TREATMENT**

1. Nerve agent pre-treatment is an option as a threat-dependent pre-exposure MedCM which may be issued to deployed personnel as a pharmaceutical agent that enhances the efficacy of post-exposure antidote, such as pyridostigmine bromide (PB).
2. If nerve agent pre-treatment is deployed or used, supporting allied medical facilities and personnel must be informed in order to prevent potential drug interactions, e.g. some anaesthetic agents such as muscle relaxants.

##### **B.4.2. NERVE AGENT IMMEDIATE THERAPY**

1. Nerve agent immediate therapy will be used following exposure to a nerve agent and the presence of adverse effects due to the nerve agent. A nerve agent immediate therapy for use as a first aid measure must contain an efficacious antidote (or combination) for nerve agents such as:
  - a. *Anti-muscarinic*. An effective and rapid-acting anti-muscarinic (either as a single dose of two milligrams of atropine or equivalent but not be so potent as to incapacitate the individual and prevent the individual from continuing with the mission).
  - b. *Cholinesterase reactivator*. An effective, rapid-acting, broad-spectrum cholinesterase reactivator e.g. an oxime (type and dose at the discretion of the nation concerned but must inform other participating nations); and/or
  - c. *Anticonvulsant*. An effective and rapid-acting anticonvulsant (when given as a single dose is not so potent as to severely incapacitate or impair breathing).



2. The device to administer the antidote(s) should:
  - a. Be given by intra-muscular (IM) injection (or other effective means);
  - b. Be absorbed rapidly into the body within 10 mins;
  - c. Operate automatically;
  - d. Be simple, rapid and safe to use even in the dark;
  - e. Be clearly identifiable from all other automatic injection devices for other uses;<sup>12</sup>
  - f. Allow storage for several years;
  - g. Allow use in operational climatic conditions. In cold climates, necessary precautions should be taken to prevent freezing of the injection solution; and
  - h. Include a method for annotating casualty that MedCM has been used.
3. At national discretion, it is recommended that units hold a 100% reserve of nerve agent antidote in order to be able to resupply personnel operating in a CBRN-threat environment.

#### **B.4.3. NERVE AGENT MEDCM PROLONGED FIELD CARE**

1. Prolonged field care and continuing nerve agent MedCM therapy by enhanced CBRN first aid and medical personnel includes:
  - a. Bulk vials of an effective anti-muscarinic including atropine sulphate (or equivalent) for intravenous or intraosseous use.
  - b. An effective and broad-spectrum cholinesterase reactivator (or alternatives) for intravenous or intraosseous use (type and dose at the discretion of the individual nation but in discussion with NATO medical advisor (MEDAD) for parenteral use).
  - c. An effective anticonvulsant for intravenous or intraosseous use.
2. The duration of continuing therapy is dependent on casualty estimation, CBRN medical planning and clinical timelines, based on casualty and medical evacuation constraints.

#### **B.4.4. VESICANT (BLISTERING AGENT) IMMEDIATE THERAPY**

Immediate therapy for vesicants will be required for those that have early onset lethal effects (e.g. arsenic-based agents such as Lewisite) and to prevent permanent disability including blindness. A vesicant immediate therapy for use as a first aid measure includes:

- a. *For Lewisite* (or other arsenicals). An arsenic-chelating compound administered either locally to skin and eyes, as well as systemic (orally or parenterally) to mitigate:
  - (1) System toxicity.
  - (2) Chemical burns.

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<sup>12</sup> For colour identification, see AMedP-1.12: *Medical and Dental Supply Procedures*. [Atropine (bright yellow), oxime (light brown), anticonvulsant (grey)].

- (3) Eye damage (blindness).
- b. *For eye management:*
  - (1) A fluorescein eye preparation and UV light, as available.
  - (2) A broad-spectrum antimicrobial ophthalmic ointment / preparation (e.g. chloramphenicol eye ointment).
  - (3) A mydriatic (pupil dilating) ophthalmic preparation (anticholinergic or cycloplegic).
- c. *For symptomatic treatment:*
  - (1) An antipruritic (anti-itching) preparation.
  - (2) Inhaled bronchodilators (and supporting devices) either as inhaler or nebuliser.<sup>13</sup>

#### **B.4.5. PULMONARY (CHOKING) IMMEDIATE THERAPY**

Immediate therapy for pulmonary agents will be required for those that have early onset respiratory effects. A pulmonary agent immediate therapy for use as a first aid measure includes:

- a. Inhaled bronchodilators either as inhaler or nebuliser.
- b. Inhaled steroid following exposure to some pulmonary agents (nation-specific requirements).

#### **B.4.6. CYANIDE IMMEDIATE THERAPY**

1. Cyanide immediate therapy will be used following known exposure to cyanide and the presence of adverse effects due to cyanide. In general, only T1 casualties require any MedCM other than oxygen. Due to the rapid action of cyanide and its related compounds (cyanogens), cyanide MedCM must be given as soon as safe and possible (i.e. within 10 minutes).

2. All symptomatic cyanide cases should be given oxygen, where available and within scope of practice of the first aid provider. Inhaled amyl nitrite may also be an option at this point and does not require advanced skills.

3. Cyanide immediate therapy must contain an efficacious antidote (or combination). Cyanide antidotes vary significantly between nations and there is a risk of adverse interactions. First aid management is a national responsibilities but on operations with more than one nation providing first aid and medical care, MedCM should be discussed with the MEDAD and CBRN Advisor. Cyanide immediate therapy includes:

- a. A combination of *methaemoglobin-forming compounds* (inhaled amyl nitrite (optional), parenteral sodium nitrite (or 4 dimethyl amino-phenol (DMAP))), then followed by intravenous sodium thiosulfate.

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<sup>13</sup> Considerations for nebuliser use instead of inhaler includes training of personnel, driving force to deliver the bronchodilator (gas or other measures), electrical power requirement and the requirement to administer oxygen at the same time. An alternative may be inhalers with a 'spacer' device.

- b. *Cobalt-containing antidotes*. Dicobalt edetate (and glucose) or hydroxocobalamin (pro-vitamin B12). Both may also be followed by intravenous sodium thiosulfate.

#### **B.4.7. INCAPACITANT IMMEDIATE / MEDICAL THERAPY**

Immediate therapy for anti-cholinergic incapacitating agents (e.g. BZ) and atropine overdose may be required but is likely to be a medical decision.

#### **B.4.8. OXYGEN THERAPY**

1. Where practicable, oxygen should be available for use by enhanced CBRN first aid providers subject to national regulation. Some nations may allow the use of oxygen by first aid providers for non-CBRN casualties with appropriate training.
2. Oxygen is an important supportive therapy for casualties with obvious respiratory distress, observed low oxygen levels (saturations) and/or cyanosis (blue skin discolouration). For some chemical agents, such as cyanide, it may also be an antidote. While there are may be restrictions to the use of oxygen in some medical patients in the civilian context (e.g. chronic respiratory disorders), this is highly unlikely to be the case in the military environment.

#### **B.5. BIOLOGICAL AGENT MEDCM**

1. The two concepts for post-exposure use are prophylaxis (prevention) and treatment, and similar broad-spectrum antibiotics may be appropriate. Biological MedCM in the context of CBRN first aid may be used either as a CBRN Defence MedCM (prevention) or for immediate therapy especially if there is a delay to access to medical support. The choice of antibiotic (and/or vaccination) is a national responsibility but participating nations must inform the MEDAD of the choice and options to ensure optimal biological casualty care as well as minimise drug interactions.
2. The most likely route for administration for first aid providers as well as self-administration is oral although intramuscular injections and inhaled may also be options depending on threat and deployed MedCM. Although new generation antibiotics may be deployed, the two main antibiotics used for biological MedCM are:
  - a. Ciprofloxacin; and
  - b. Doxycycline.
3. Where there is a biological threat, all nations must have a sufficient stockpile and distribution plan for 100% of deployed personnel to start and continue use for one week before resupply both within theatre and strategic.

#### **B.6. RADIOLOGICAL MEDCM**

1. Post exposure radiological MedCM is unlikely within the context of CBRN first aid. However, prolonged field care may require MedCM to be given before access to a medical treatment facility. Empirical use will depend of the exposure risk, effectiveness of physical protective equipment and any supporting evidence of any internalisation of radiological contamination.
2. An example of a safe and effective MedCM used following a nuclear incident is stable iodine, used as a blocking agent to stop radioactive iodine accumulating in the thyroid gland

and causing thyroid cancer. Some radiological MedCM may require evidence of internalisation either by nasal swabs, urine or faeces collection before the justifying the risk of any adverse drug reactions.

3. MedCM for acute radiation syndrome may include the use of an anti-emetic (e.g. ondansetron or granisetron) either to prevent or stop vomiting.

**Note.** Any use of an anti-emetic must be recorded and reported as this may affect dose assessment based on prodromal symptoms such as nausea, vomiting and diarrhoea.

## **B.7. CBRN FIRST AID EQUIPMENT**

CBRN first aid will require safety and non-pharmaceutical medical equipment. Where ever possible, generic medical equipment should be used that can be applied to trauma and CBRN casualties.

### **B.7.1. SAFETY**

The following additional items are recommended for CBRN first aid:

- a. Appropriate CBRN DIM equipment to detect CBRN agents, contamination and effectiveness of decontamination.
- b. Suitable protective gloves (e.g., butyl rubber 1.2 or 1.7 millimetre thickness, double/triple nitrile gloves).

### **B.7.2. MEDICAL EQUIPMENT**

#### **B.7.2.1. CATASTROPHIC HAEMORRHAGE**

The following items are recommended for CBRN first aid for use within the scope of practice of the first aid provider:

- a. Rapid application tourniquet suitable for use with butyl gloves.
- b. CBRN wound dressing (see below).

#### **B.7.2.2. BASIC AIRWAY MANAGEMENT**

The following items are recommended for CBRN first aid for use within the scope of practice of the first aid provider:

- a. Equipment for suctioning.
- b. Supraglottic airway allowing suction of respiratory secretions.

#### **B.7.2.3. BREATHING SUPPORT**

The following items are recommended for CBRN first aid for use within the scope of practice of the first aid provider:

- a. Portable apparatus for positive pressure resuscitation capable of delivering uncontaminated air (if sealed circuit) with supplementary oxygen and operation by semi-skilled personnel.

#### **B.7.2.4. WOUND MANAGEMENT**

The following items are recommended for CBRN first aid for use within the scope of practice of the first aid provider:

- a. Sterile saline for wound irrigation (various volumes dependent on wound size).
- b. CBRN wound dressing (see below).

#### **B.7.2.5. MEDICAL MONITORING EQUIPMENT**

The following monitoring capabilities are recommended to support triage and CBRN first aid in the hot and warm zones within the scope of practice of the first aid provider:

- a. Heart monitoring in order to assist life-sign assessment and monitoring efficacy of nerve agent therapy.
- b. Oxygen saturation to inform oxygen requirements, efficacy of treatment and oxygen resource management.
- c. Temperature monitoring (core or peripheral) for biological casualty and heat illness assessment and management, and hypothermia prevention during and following decontamination.
- d. Agent-specific point of care testing, subject to threat and potential impact on casualty care.

#### **B.7.2.6. MISCELLANEOUS EQUIPMENT**

The following items are recommended for CBRN first aid for use within the scope of practice of the first aid provider:

- a. Casualty warming and drying equipment (e.g. blankets) for pre- or post-decontamination.
- b. CBRN First Aid Aide-Memoire (AMedP-7.2.1.).
- c. Casualty report forms and supporting stationary or IT solution.

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## ANNEX C – CBRN CASUALTY PROTECTIVE EQUIPMENT

### C.1. INTRODUCTION

1. CBRN CPE is a suite of physical protective equipment and as the overarching concept is described in detail in AMedP-7.1 Annex 15A. CBRN CPE is intended to:
  - a. Protect a casualty from a CBR environment.
  - b. Protect responders and MEDEVAC platforms from contaminated or contagious live casualties / patients.<sup>14</sup>
  - c. Protect the casualty from themselves (e.g. off-gassing).
  - d. Enhance medical care and prevent further exposure through wounds in a CBRN environment.
  - e. Protect responders, transportation platforms and infrastructure from a contamination or contagious fatality.
2. For CBRN first aid, CPE ranges from local wound protection, through to respiratory and whole body protective systems delivered at unit level. The function of the protective system may be passive, or positive/negative pressure protection. The two systems that are relevant to CBRN first protection are:
  - a. CBRN casualty respiratory protective equipment; and
  - b. CBRN wound dressing.
3. Both systems should:
  - a. Be self-contained and man-portable;
  - b. Be able to operate in a wide number of operational climates; and
  - c. Be interoperable with medical and other military materiel.

### C.2. CBRN CASUALTY EVACUATION EQUIPMENT

1. CBRN casualty evacuation equipment is intended for non-medical unit level use (as well as medical personnel). Respiratory protective is the minimum level of CPE to provide respiratory and eye protection for casualties unable to wear a respirator either due to airway problems, breathing difficulty or non-compliance. The minimum requirement is the ability to:
  - a. Provide protection against specified CBR hazards, and to contain casualty contamination.
  - b. Be fitted by the casualty, or by a CBRN first aid provider/medical personnel.
  - c. Operate effectively for at least one hour in a CBR-contaminated environment.

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<sup>14</sup> CBRN MEDEVAC equipment is described in AMedP-7.1 Annex 15A.

- d. Provide air filtration / exchange to prevent the build-up of any off-gassing or CO<sub>2</sub>.
- e. Allow continuing first aid including:
  - (1) The observation of the casualty's face, head and neck.
  - (2) Manage catastrophic haemorrhage especially around the head, face and neck.
  - (3) Perform basic airway management.
  - (4) Administer immediate therapy MedCM.
- f. Be suitable for use on casualties in specified positions upright, sitting, and lying supine (on back) and semi-prone (recovery position).

2. An option of whole body coverage remains for nations, however this will convert a walking casualty into a stretcher casualty. A CBRN medical evacuation system will provide whole body coverage but is a purely medical (or potentially SOF) capability and outside the scope of this publication.

### **C.3. CBRN WOUND DRESSING**

A CBRN wound dressing provides the ability to protect wounds from CBRN agents and control haemorrhage. The dressing should have at least the same capability and function as a conventional wound dressing. Following wound decontamination, there may still be residual contamination that may require surgical debridement (removal of contamination and dead tissue). The CBRN wound dressing should:

- a. Provide protection against external CBR hazards.
- b. Be fitted to a casualty by a CBRN first aid provider or medical personnel.
- c. Operate effectively for at least six hours in a CBRN-contaminated environment.
- d. Provide haemorrhage control.
- e. Cover an area of injury consistent with in-service trauma bandages.
- f. Decontaminate a CBR-contaminated wound either by adsorption or neutralisation.
- g. Inform personnel of any CBR residual hazard associated with the wound.
- h. (Optional) Repair IPE.



<b>ANNEX D – CBRN FIRST AID TRAINING MATERIEL</b>
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### **D.1. CBRN FIRST AID TRAINING EQUIPMENT<sup>15</sup>**

Collective training and exercises require training equipment to support casualty care training and other combat simulation:

- a. Disposable or reusable uniform to support casualty decontamination including:
  - (1) IPE.
  - (2) Military uniform.
  - (3) Civilian clothing (including paediatric), as required
- b. Training variants of in-service medical and MedCM delivery devices including:
  - (1) Training tourniquet, or simulant.
  - (2) Wound dressings.
  - (3) Antidote auto-injectors.
  - (4) Simulation oral medication.
  - (5) Pharmaceutical products and fluids including labelling.
- c. Triage equipment or labels.
- d. Casualty simulation including:
  - (1) Casualty make-up.
  - (2) Casualty simulation manikins to support mass casualty decontamination and handling.
  - (3) High definition simulation to support casualty assessment and interventions.
- e. Blank casualty report forms.

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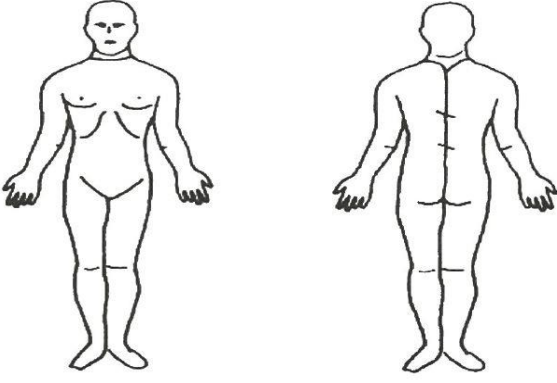

<sup>15</sup> *Lessons learnt.* Medical and CBRN exercises have highlighted the requirements for training equipment to support effective medical exercises including casualty handover.

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**ANNEX E – CBRN CASUALTY REPORT FORM**

RESTRICTED – MEDICAL (when completed)

CBRN Med Form 1

CBRN MEDICAL REPORT FORM					
Name:		Date: / /	Sex: Male / Female	Age:	or DOB: / /
Nationality:	Rank:	Service No:	Service:	Unit:	
Location:		Incident time (if overt): : :	Time of symptom onset: : :	Arrival time: : :	
Type of Incident:	<input type="checkbox"/> Chemical [suspected agent ] <input type="checkbox"/> Biological [suspected agent ] <input type="checkbox"/> Radiological <input type="checkbox"/> Nuclear				
	<input type="checkbox"/> Explosive [type ] <input type="checkbox"/> Other [ ]				
		<input type="checkbox"/> Suspected <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed <input type="checkbox"/> DIM equipment used [ ] Reading [ ]			
Physical Protection:	Respiratory [CBRN <input type="checkbox"/> / Particulate <input type="checkbox"/> / Other_____ ] <input type="checkbox"/> Gloves <input type="checkbox"/> Protective suit <input type="checkbox"/> Other [ ]				
Pre-Exposure MedCM:	<input type="checkbox"/> Chem [ ] <input type="checkbox"/> Bio [ ] <input type="checkbox"/> Rad [ ]				
INJURIES & CONTAMINATION:			CBRN QUICK LOOK		
 <p># Fracture +++ Wound //// Contaminated area</p>			Conscious	<input type="checkbox"/> Alert <input type="checkbox"/> Verbal <input type="checkbox"/> Pain <input type="checkbox"/> Unconscious <input type="checkbox"/> Fitting	
			Respiratory	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal <input type="checkbox"/> Asymmetrical <input type="checkbox"/> Absent /min	
			Eyes	<input type="checkbox"/> Pinpoint <input type="checkbox"/> Normal <input type="checkbox"/> Wide 	
			Secretions	<input type="checkbox"/> Normal <input type="checkbox"/> Secretions <input type="checkbox"/> Dry	
			Skin	<input type="checkbox"/> Normal <input type="checkbox"/> Sweaty <b>BURNS</b> <input type="checkbox"/> Cyanosed <input type="checkbox"/> Pink <input type="checkbox"/> Chemical <input type="checkbox"/> Purpuric rash <input type="checkbox"/> Thermal	
			Other	Pulse <input type="checkbox"/> Rad <input type="checkbox"/> Fem <input type="checkbox"/> Carotid ECG <input type="checkbox"/> Sinus Rate /min <input type="checkbox"/> Abnormal <input type="checkbox"/> Vomiting or <input type="checkbox"/> Diarrhoea onset [ : : ]	
EMERGENCY MEDICAL TREATMENT AND HAZARD MANAGEMENT					
TRIAGE O/A	<b>T</b>	HAZARD: <input type="checkbox"/> Gas/Vapour <input type="checkbox"/> Liquid <input type="checkbox"/> Dry/particulate <input type="checkbox"/> Wound <input type="checkbox"/> Unknown <input type="checkbox"/> Contagious (suspected) MANAGEMENT: <input type="checkbox"/> Removal of clothing <input type="checkbox"/> Dry contamination <input type="checkbox"/> Rinse <input type="checkbox"/> Full wet contamination <input type="checkbox"/> Isolation			
Catastrophic Haemorrhage:		Site(s): [ ] [ ] [ ] [ ] [ ] [ ] <input type="checkbox"/> CAT Applied Time: [ : : ] <input type="checkbox"/> Haemostatic Time: [ : : ] <input type="checkbox"/> FFD Site(s): [ ] [ ]			
Airway:		<input type="checkbox"/> OPA / NPA Size: [ ] <input type="checkbox"/> LMA Size: [ ] <input type="checkbox"/> ETT Size: [ at ] <input type="checkbox"/> RSI Time: [ : : ] <input type="checkbox"/> Surgical Airway			
Antidotes / MedCMs & other therapeutics:		<input type="checkbox"/> ComboPens Number given [ ] <input type="checkbox"/> Oxime [ ] total [ ] <input type="checkbox"/> Atropine total [ ] <input type="checkbox"/> Benzodiazepine [ ] total [ ] <input type="checkbox"/> Naloxone total [ ] <input type="checkbox"/> Amyl nitrite <input type="checkbox"/> Dicobalt edetate <input type="checkbox"/> 300mg <input type="checkbox"/> 600mg & <input type="checkbox"/> Glucose <input type="checkbox"/> Sodium nitrite <input type="checkbox"/> Sodium thiosulphate ANTIBIOTIC(S): [1: ] dose [ ] [2: ] dose [ ] [3: ] dose [ ] ANALGESIA: <input type="checkbox"/> Morphine total [ ] <input type="checkbox"/> Fentanyl total [ ] <input type="checkbox"/> Ketamine total [ ] <input type="checkbox"/> Ondansetron dose [ ] OTHER(S): [1: ] dose [ ] [2: ] dose [ ] [3: ] dose [ ]			
Breathing:		<input type="checkbox"/> Oxygen <input type="checkbox"/> BVM <input type="checkbox"/> Needle decompression <input type="checkbox"/> L <input type="checkbox"/> R <input type="checkbox"/> Thoracostomy <input type="checkbox"/> / Chest drain <input type="checkbox"/> L <input type="checkbox"/> R <input type="checkbox"/>			
Circulation:		<input type="checkbox"/> IV/IO Site: [ ] Size: [ ] <input type="checkbox"/> IV/IO Site: [ ] Size: [ ] <input type="checkbox"/> CPR duration [ mins] FLUIDS: <input type="checkbox"/> Crystalloid: [ ] Volume: [ ] <input type="checkbox"/> Blood: [ ] Volume: [ ]			
Other interventions and comments:					
COLD ZONE TRIAGE CAT	<b>T</b>	OUTCOME	<input type="checkbox"/> Casualty Clearing Station <input type="checkbox"/> Survivor Reception Centre <input type="checkbox"/> RTU/Home <input type="checkbox"/> MTF/Hospital Name: [ ] <input type="checkbox"/> Mortuary <input type="checkbox"/> Other: [ ]		
CDL Handover Time	: :	Completed by:			Initials

RESTRICTED – MEDICAL (when completed)

Version 1.1 (Feb 11)

**Explanation note.** The CBRN Casualty Report Form has generic sections following the same all-hazard approach to CBRN and combined casualties (as shown in black). The central section may Nation or Operation-specific due to differing MedCM although the form includes a section for 'Other treatment'.

<b>LEXICON</b>
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2-PAM	Pralidoxime Chloride
4-DMAP	4-Dimethylaminophenol Hydrochloride
AC	Hydrogen Cyanide
Ach	Acetylcholine
AJMedP	Allied Joint Medical Publication
AMC	Advanced Medical Care
AMedP	Allied Medical Publication
AP	Allied Publication
ARS	Acute Radiation Syndrome
AXP	Ambulance Exchange Point
BA	Biological Agent
BAL	British Anti-Lewisite (Dimercaprol)
BSR	Battle Stress Reaction
BZ	3-Quinuclidinyl benzilate
<C>ABC	Catastrophic haemorrhage, Airway, Breathing and Circulation
CASEVAC	Casualty Evacuation
Cat Haem	Catastrophic Haemorrhage
CBRN	Chemical Biological Radiological and Nuclear
(Fwd) CCP	(Forward) Casualty Collection Point
CDA	Casualty Decontamination Area
CDL	Clean Dirty Line
COLPRO	Collective Protection
CPE	Casualty Protective Equipment
CRESS	Consciousness, Respirations, Eyes, Secretions and Skin (Assessment)
DAT	Defence Against Terrorism
DIM	Detection Identification and Monitoring
DU	Depleted Uranium
EMT	Emergency Medical Treatment
Evac	Evacuation
HAZMAT	Hazardous Materials
HLS	Helicopter Landing Site
IED	Improvised Explosive Device
IPE	Individual Protective Equipment
IV	Intravenous
LSD	D-lysergic acid diethylamide
LSI	Life-Saving Intervention
MASCAL	Mass Casualty
MEDAD	Medical Advisor
MedCM	Medical Countermeasure

MEDEVAC	Medical Evacuation
MO	Medical Officer
MTF	Medical Treatment Facility
NA	Nerve Agent
OPS	Operational Performance Statement
PB	Pyridostigmine Bromide
PoE	Point of Exposure
PoW	Point of Wounding
PPE	Personal Protective Equipment
PTSD	Post-traumatic Stress Disorder
RCA	Riot Control Agent
RoM	Restriction of Movement
RPS	Role Performance Statement
SIBCRA	Sampling Identification of Biological, Chemical and Radiological Agents
SOF	Special Operations Forces
SRD	Standardisation Related Document
SSFF	Strip, Soak, Fan and Fluids
STANAG	Standardisation Agreement
TO	Training Objectives

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**AMedP-7.2(A)(1)**